PROJECT 9A

Orland Unit Water Users' Association and Tehama-Colusa Canal Authority Regional Water Use Efficiency Project

1. Project Description

Project Type:	System improvement
Location:	Colusa Basin, northern Glenn County
Proponent(s):	Orland Unit Water Users' Association (OUWUA) and Tehama-Colusa Canal Authority (TCCA)
Project Beneficiaries:	OUWUA and other local water users, Stony Creek, Sacramento River, Sacramento-San Joaquin Delta, other Sacramento Basin users
Total Project Components:	Short-term components, final design and construction of new OUWUA distribution system, regional conveyance pipelines, conjunctive management facilities
Potential Supply:	30,000 acre-feet per year (ac-ft/yr) to 100,000 ac-ft/yr
Cost:	Approximate total capital costs $98 million to $215 million, depending on actual facilities' configuration
Current Funding:	$200,000 from CALFED and Prop 13 grants for feasibility study
Short-term Components:	Feasibility studies, pilot projects, begin conceptual design and environmental process
Potential Supply (by 2003):	Minimal supply provided by supporting pilot projects
Cost:	$300,000 for feasibility study; up to $5.0 million for short-term pilot projects
Current Funding:	$200,000 from CALFED and Prop 13 grants for feasibility study
Implementation Challenges:	Environmental issues; strong coordination among local, state, and federal agencies and specific regional-scale projects; water rights issues
Key Agencies:	OUWUA, TCCA member districts, Glenn-Colusa Irrigation District (GCID), Glenn County, Tehama County water interests, local landowners, U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), U.S. Bureau of Reclamation (USBR), California Department of Water Resources (DWR), environmental interest groups, California Department of Fish and Game (CDFG), State Water Resources Control Board

Summary

The OUWUA is pursuing a cooperative project with TCCA to evaluate concepts for distribution system modernization, regional conveyance and supply facilities, and conjunctive management. The project goal is to implement key infrastructure elements of a regional water management strategy to provide the following benefits: improve conveyance and water use efficiency within the OUWUA service area, improve water supply reliability and reduce seasonal surface water diversions on the Sacramento River at Red Bluff Diversion Dam (RBDD), expand conjunctive management of groundwater and surface water resources in the OUWUA and nearby areas, improve fishery conditions on Stony Creek and the Sacramento River, and increase quantity of surface water at critical times of year to meet other beneficial needs in the Sacramento River basin. The project's key conceptual components are illustrated on Figure 9A-1. The ultimate configuration of the facilities will depend on the results of various feasibility studies, including the CALFED Integrated Storage Investigation (ISI) program and other Phase 8-related projects. The major components listed below should therefore be viewed as being relatively independent of each other, with a potential for implementing one or more without necessarily requiring all of the other components.

- Converting the OUWUA service area distribution system from an open-channel, rotation delivery irrigation system to a pressurized, piped distribution system.
- Removing OUWUA's North Diversion Dam on Stony Creek, which is presently a barrier to anadromous fish migration, and replacing this with either an improved surface diversion or a buried pipeline connection from the South Canal.
- Constructing a new pipeline or canal from the base of Black Butte Dam to the Tehama-Colusa (TC) Canal, routed through the southern portion of the OUWUA service area, and replacing the existing OUWUA South Canal. This would eliminate the need for the seasonal gravel diversion dam on Stony Creek at the TC Canal Constant Head Orifice (CHO).
- Integrating conjunctive water management into the OUWUA distribution system and neighboring areas by establishing a network of groundwater wells and recharge basins adjacent to the OUWUA distribution system and nearby areas along the Stony Creek Fan. Diverting available seasonal excess flows from surface supplies into the recharge basins located within the project area would facilitate groundwater recharge back into the aquifer.
- Development of power generation potential using one or more low-head hydropower generating station(s) on the new pipeline(s). The power supply could be used to offset power consumption from local conjunctive management wells or other large power loads.

Short-term Component

The short-term components of this project consist of feasibility studies, which would be followed by one or more small-scale pilot projects based on the study findings. Environmental study work would then follow or begin in parallel with the pilot projects. The feasibility study to investigate OUWUA distribution system efficiency improvements would cost approximately $140,000, and could be started immediately. A feasibility study for the

regional pipeline and conjunctive management program is estimated to cost about $300,000, and could begin immediately. The costs for the pilot projects would depend on the findings of the feasibility studies. An approximate cost of $5 million is assumed for pilot projects at this time. It is anticipated at this time that small-scale pilot projects would focus on modernizing a selected system lateral to assess the benefits and support implementation of the OUWUA system modernization. The pilot project could include installing a piped system to replace an existing open-channel lateral, and improved water measurement facilities. The pilot project(s) could be coordinated with other pilot projects such as the CALFED ISI-supported conjunctive management studies in the Stony Creek area. Depending on location and local conditions, such a project could potentially generate a small quantity of water available for in- or out-of-basin use by 2003.

Long-term Component

The primary purpose of this evaluation is to evaluate the potential for this project to provide water supply benefits in the short-term (by end of 2003). As part of this initial evaluation, potential long-term components of the proposed project (defined as any part of the project proceeding past or initiated after December 2003) have been considered on a conceptual level. Further consideration and technical evaluation of long-term component feasibility and cost will occur as the next level of review under the Sacramento Valley Water Management Agreement. Long-term-component project descriptions are included in these short-term project evaluations only as a guide to the reader to convey overall project intent.

Background

Orland Unit Water Users' Association. The OUWUA operates the Orland Project, one of the oldest USBR projects in California (see Figure 9A-2 for project location). The Orland Project's primary facilities include two dams to store water in the upper Stony Creek watershed, East Park and Stony Gorge; 17 miles of canals; and 139 miles of laterals to serve approximately 19,000 acres (out of a total of 20,144 acres in the Orland Project) of irrigated agriculture. The OUWUA service area has very good conditions for agriculture. The project's soil is considered some of the richest and most productive in the nation. The Orland area is warmed by a thermal belt with very few frosts. Average rainfall is 18 inches, most of which is measured between the first of November and the first of April. With very little snow, winter runoff from the Stony Creek watershed occurs almost immediately after precipitation. The Stony Creek watershed has an average annual runoff of 410,000 ac-ft.

Tehama-Colusa Canal Authority. TCCA operates the TC Canal, which is supplied with Sacramento River water diverted at RBDD. The canal supplies water to the 17 member districts of TCCA. The water supply reliability of TCCA districts has been greatly diminished by restrictions on the seasonal operations of RBDD, which were imposed to address fish passage problems on the Sacramento River, and by the increased frequency and magnitude of Central Valley Project (CVP)-supply cutbacks under the terms of the Central Valley Project Improvement Act (CVPIA). USBR is working with TCCA to investigate potential long-term solutions to RBDD operations impacts on supply and address the fishery issues. The TC Canal runs through the OUWUA service area where it crosses Stony Creek via a buried siphon. The TC Canal can also be supplied with surface water diversions from Stony Creek using a seasonal gravel diversion dam to form an elevated pool in Stony Creek and gravity to divert flows into the canal via the CHO. The CHO is basically a "two-

way" turnout that can divert water from TC Canal into Stony Creek (for fishery enhancement) or can be used to supply water from Stony Creek into the TC Canal. The CHO is no longer used to divert flows into Stony Creek. The gravel diversion dam used to divert flows into the TC Canal creates a fish passage barrier when in place.

Cooperative Project Concepts

Orland Unit Water User's Association Distribution System Improvements. A critical local issue for OUWUA is the relatively high conveyance losses and low on-farm efficiency in the service area because of the age of the open-channel canals and laterals and the use of a rotation-based irrigation delivery schedule. The conveyance and irrigation losses result in a need for increased diversion and use of Stony Creek watershed supply, and reduced ability to hold back supplies in the upper watershed reservoirs for managed use elsewhere. OUWUA has two reservoirs in the upper Stony Creek watershed with a combined storage capacity of approximately 100,000 ac-ft, or about 25 percent of the average annual watershed runoff.

Most of the existing distribution system was constructed between 1900 and 1920 and consists of open-channel canals and laterals. The system includes 17 miles of canals and 139 miles of laterals. Much of the system was lined with concrete because of the relatively steep gradients and resulting flow velocity. The existing system is in a degraded state with maintenance and repair costs increasing each year and relatively high operational spills and other losses. Deliveries are made on a "rotation" basis, which provides each portion of the service area with water delivery for a fixed period (e.g., 24 hours) at scheduled daily intervals. The combination of rotation delivery and open-channel delivery hampers each irrigator's ability to improve on-farm irrigation efficiency through common methods such as more exact matching of actual crop water need and applied water depth and more efficient and uniform application methods such as sprinklers and drip irrigation.

The proposed distribution system modernization would convert a significant portion of the system to a buried, pressurized pipe delivery system. This would essentially eliminate conveyance losses within the piped portion of the service area. The system would also provide "on-demand" irrigation scheduling, allowing each grower to more closely match the timing and depth of applied water indicated by the specific crop, soil type, and other local factors.

The feasibility study would include an evaluation of existing and potential future conveyance and on-farm efficiency to estimate the conservation potential of the project. A very rough estimate of the potential reduction in diversions can be made from the current irrigated acreage and diversion quantities. Annual diversions are approximately 100,000 ac-ft, resulting in an estimated average per-acre supply of 5 ac-ft/ac. Average "project-wide" efficiency can be estimated as the ratio of consumptive use to total diversions. Using an average crop evapotranspiration of applied water (ETAW) of approximately 2.4 feet, the "system-wide" efficiency is approximately (2.4 feet/5.0 feet), or about 48 percent. Assuming approximately 10-percent conveyance losses mainly from operational spills, the resulting average "on-farm" efficiency is approximately 53 percent, which is common for the flood irrigation methods used currently.

Using this approximate baseline for existing conditions, a piped conveyance system that reduces conveyance losses to essentially zero percent and makes possible on-farm efficiency

of about 70 percent through use of improved application methods would result in required future diversions of approximately 68,000 ac-ft. This reduction in the diversion requirement would then make it possible to reallocate up to 30,000 ac-ft on average each irrigation season. The 30,000 ac-ft of seasonal supply could be stored in the upper reservoirs or released for other targeted beneficial uses. The ability to reallocate this supply would in turn be supported by the other components of the project as follows.

Regional Conveyance Pipeline. The feasibility study would include evaluation of a regional conveyance pipeline routed from the base of Black Butte Dam through the OUWUA service area to TC Canal. This facility would help address at least two critical local water supply issues: restrictions on the use of RBDD which reduce the reliability of the TCCA supply, and conflicts between fish passage and diversion of flows from Stony Creek below Black Butte Dam. By providing a direct conveyance connection from the base of Black Butte Dam to TC Canal, early season (March to May/June) supplies from Stony Creek could be conveyed into TC Canal, offsetting the reduced diversions from Red Bluff. Use of Stony Creek supplies would also no longer require use of the North Diversion Dam or the construction of the seasonal gravel dam barrier across Stony Creek, required to back up water for diversion into TC Canal.

The seasonal operations of the pipeline would be intended to make improved use of both existing supplies through improved matching of supplies and demands, and to provide increased inter-annual supplies to the Sacramento Basin overall by allowing diversion and storage of excess winter season flows. During the winter (January through March), the pipeline could be used to convey excess Stony Creek flows into TC Canal for conveyance to local or regional groundwater recharge facilities as well as to a future Sites Reservoir off-stream storage facility. From March through mid-May, the pipeline could be used to supply both OUWUA needs and TCCA needs, reducing diversions at Red Bluff for TC Canal. When RBDD is operational in late May/June, OUWUA could be "credited" for the water provided to TCCA in March through May through supply from TC Canal into the OUWUA distribution system. During June through September, the pipeline would provide OUWUA needs primarily and could also be used in conjunction with new groundwater development to provide surface water supply to TC Canal. Table 9A-1 summarizes the concepts for this regional pipeline based on the target level of seasonal supply capacity.

Conjunctive Management Concepts. The OUWUA service area lies over the confluence of the Stony Creek channel and the northern portions of the Stony Creek Fan groundwater basin. The combination of these groundwater resources, potentially favorable recharge conditions, and the surface water supply and distribution facilities (TC Canal, OUWUA service area, TCCA member district service areas) provides a strong potential for a conjunctive management program to utilize the surface and groundwater resources for maximum local and regional water supply benefits. *The conjunctive management concepts presented here should be considered in the context of other conjunctive management proposals such as projects 5B, 5E, and 8A, each of which are considering development of a common groundwater resource within the Stony Creek Fan aquifer. Ideally, these various projects would be evaluated and developed in a coordinated manner under the CALFED ISI-sponsored investigation currently in progress with Orland-Artois Water District (OAWD), OUWUA, and GCID.*

TABLE 9A-1
Conceptual Facility Features for Regional Black Butte to TC Canal Pipeline
Orland Unit Water Users' Association and Tehama-Colusa Canal Authority Regional Water Use Efficiency Project

Facility Feature	Description	Notes
Number of Conduits	2	Parallel pipelines in same corridor
Size (diameter)	96 inches	
Length	8 miles	Would depend on final route
Flow Capacity	700 cfs	Based on 7 ft/sec design velocity
Static Head	120 ft	50 ft of head-loss at design flow, leaving 70 ft residual at turnout to TC Canal
Seasonal Volume	108,000 ac-ft (90 days)	Assumes 90 days average seasonal operation; potential supply to TC Canal, groundwater recharge facilities, local uses
Hydropower Generation Potential	3.8 MW	Potential power revenue would depend on range of seasonal power production—8,200 MWh for 90 days

cfs = cubic feet per second
ft/sec = feet per second
ft = feet
MW = megawatt
MWh = megawatt per hour

The conceptual outline for conjunctive management under this project is as follows. Local groundwater pumping would be done on a seasonal basis for two basic beneficial purposes. First, local groundwater pumping in the OUWUA service area could allow reduced diversions from OUWUA's Stony Creek surface water supply, allowing an equivalent quantity of water to be held in storage in the upper reservoirs and released for other targeted beneficial uses. These beneficial uses could include a mix of other local irrigation needs, in-stream flow or other environmental uses, or transfer to third parties under appropriate arrangements. Second, local groundwater pumping by TCCA member district service areas could help cover the supply deficit caused by CVPIA-instituted supply cutbacks as well as seasonal restrictions on the operation of RBDD.

Recharge of the groundwater basin would occur from a mix of "in-lieu" recharge (natural recharge with reduced groundwater pumping in wet years) and direct recharge from infiltration basins supplied with surface water using a combination of the regional surface water distribution facilities, including TC Canal and the proposed regional pipeline from Black Butte Dam.

The potential yield from the conjunctive management, in terms of dry-year yield only or average annual yield, is unknown. However, previous investigations of the Stony Creek Fan groundwater basin, together with some potential "demand-side" annual yield targets, provide a range of potential development levels for further evaluation. Ongoing investigations through the CALFED ISI program are expected to firm up the groundwater development potential for this area over the next several years. The conceptual framework for this project focuses primarily on the local conjunctive management aspects in and around OUWUA and nearby TCCA member districts. Management targets for such a program could focus on a range of goals such as meeting unmet OAWD needs (approximately 40,000 ac-ft/yr), replacing TCCA's existing allowable CVP Stony Creek surface diversion (approximately 38,000 ac-ft/yr), offsetting seasonal minimum in-stream Stony Creek flows (16,000 ac-ft/yr),

or targeting transfers to other beneficial uses. Various combinations of these potential development targets suggest that the conjunctive management studies may evaluate dry-year pumping levels of between 50,000 and 100,000 ac-ft/yr.

The following primary types of facilities may be required for the conjunctive management portion of this project:

- **Extraction wells—** The number, size, capacity, and location of the extraction wells would be determined by detailed groundwater modeling, target seasonal and/or inter-annual yields, operating agreements between project parties, and other critical factors. Existing wells that are suitable according to the above factors could also be used under appropriate arrangements with the landowners. Using an assumed average well capacity of approximately 3,000 gallons per minute (gpm) and a seasonal pumping window of approximately 3 months, the required number of new wells for pumping up to 50,000 ac-ft/yr is between 40 and 50 wells. It is assumed that a number of existing suitable wells could be utilized under operating agreements with private well owners, which would reduce the number of new wells required.

- **Monitoring wells—** A network of monitoring wells would be required to track groundwater levels and provide critical information to ensure groundwater management objectives are being met. The monitoring well data would help track key objectives such as total recharge and extraction volumes, hydraulic gradients and flow directions for the groundwater, and impacts to other parties.

- **Distribution pipelines—** The extraction wells may discharge directly into canals or open-channel laterals in some cases, but in others it may be necessary to convey the groundwater from the wells to distribution facilities. The size and length of these pipelines would depend on the actual flow rates from wells and the well location relative to existing or future distribution systems.

- **Recharge basins—** Recharge basins may be used to accelerate the recharge of water into the groundwater basin using available excess surface water supplies in wet or normal years. The recharge basins would be located to provide "inflow" to the basin near its upgradient area, indicated by the groundwater flow and hydrogeology of the basin. The total acreage of basins required would depend on the targeted annual recharge quantity and the rate of infiltration from the basins to the underlying aquifer. Existing gravel mining sites along Stony Creek may provide suitable areas for such basins. An assumed conceptual-level sizing of the basins was done using the following parameters (general soils characteristics of the area with an assumed average infiltration rate of 0.5 foot per day): 120 days of recharge operation during wet years, approximately 50,000 ac-ft of targeted recharge, use of approximately 200 acres of reclaimed existing gravel mining basins adjacent to Stony Creek, and 600 acres of new recharge basins. The recharge basins could potentially serve a second purpose as off-canal storage facilities or drainage recapture/storage facilities.

2. Potential Project Benefits/Beneficiaries

Water Supply Benefits

The place and type of use for the project yield would depend on the following factors: the actual hydrologic conditions for each year (wet, normal, dry), the final configuration of the project facilities, project participants, operating agreements, and targeted benefits. The types of targeted water supply beneficiaries are assumed to include the following:

- **OUWUA and other local water users—**The proposed project would assist in meeting local irrigation supply requirements in OUWUA and other local water users with unmet supply requirements. In normal and wet years this supply may come primarily from surface water sources, with some groundwater use as required in drier years.
- **Stony Creek and Sacramento River—**In-stream flows and other environmental benefits in support of long-term Stony Creek and Sacramento River management objectives could potentially be met with this regional project. This increased supply to in-stream flows would come from a combination of flexibility on the use of RBDD to reduce early Spring diversions, seasonal use of groundwater to minimize the need for surface water supplies, and increased efficiency within the irrigation districts.
- **Sacramento-San Joaquin Delta and other Sacramento Basin users—**Other Sacramento Basin water supply needs, including increased net seasonal inflows to the Sacramento-San Joaquin Delta, could be met with the proposed project. This supply would likely come primarily from dry-year use of groundwater in the project area, with reduced surface water diversions providing net increases in in-stream flows to the Delta.

The potential water supply benefits of the proposed project derive from four primary sources:

1. Up to 30,000 ac-ft/yr of conserved water in the OUWUA service area from modernization of the distribution system and improved on-farm irrigation methods.
2. Up to 50,000 ac-ft/yr of conjunctive groundwater management, with extraction primarily in years of surface water supply reductions. This groundwater use would require allocation of sufficient supplies in non-pumping years as required to maintain long-term groundwater levels within acceptable levels based on management targets.
3. An undetermined quantity of annually and seasonally excess Stony Creek surface water yield, as determined by the difference between the average annul runoff of 410,000 ac-ft that occurs mostly in winter and early spring and existing uses (100,000 ac-ft/yr OUWUA; 38,000 CVP supply to TCCA; 16,000 ac-ft for environmental and in-stream flows; other miscellaneous diversions). Depending on the timing of the runoff, this quantity could be as high as 200,000 ac-ft/yr in wet years. This supply could be used for a combination of direct irrigation use, managed recharge of the groundwater basin, and conveyance to a future Sites Reservoir.
4. An undetermined quantity of Sacramento River water diverted during excess winter season flows and conveyed down the TC Canal for recharge of groundwater and later extraction during dry years.

Water Management Benefits

This project may potentially provide water management benefits primarily by increasing conveyance and on-farm efficiency, providing flexibility in the timing of surface water diversions on both the Sacramento River and Stony Creek, increasing the ability to store and target releases of surface water supplies, and providing increased flexibility and reliability through management of both surface- and groundwater supplies. The operational basis for these potential management benefits is described under Section 1. The conjunctive management of the groundwater and surface water supplies may also help to minimize impacts from increased groundwater pumping such as subsidence and long-term changes in groundwater levels.

Water Quality Benefits

The water quality benefits of the project are anticipated to derive largely from the increased seasonal in-stream flows, which generally would be expected to improve both temperature and constituent quality parameters. These benefits would need to be evaluated and modeled on a regional basis to determine both the qualitative and quantitative impacts on water quality in Stony Creek, the Sacramento River, and the Delta.

3. Project Costs

The cost opinions shown, and any resulting conclusions on project financial or economic feasibility or funding requirements, have been prepared for guidance in project evaluation from the information available at the time of the estimate. It is normally expected that cost opinions of this type, an order-of-magnitude cost opinion, would be accurate within +50 to –30 percent. Project costs were developed at a conceptual level only, using data such as cost curves and comparisons with bid tabs and vendor quotes for similar projects. The costs were not based on detailed engineering design, site investigations, and other supporting information that would be required during subsequent evaluation efforts.

The final costs of the project and resulting feasibility will depend on actual labor and material costs, competitive market conditions, actual site conditions, final project scope, implementation schedule, continuity of personnel and engineering, and other variable factors. As a result, the final project costs will vary from the opinions presented here. Because of these factors, project feasibility, benefit/cost ratios, risks, and funding needs must be carefully reviewed prior to making specific financial decisions or establishing project budgets to help ensure proper project evaluation and adequate funding.

Conceptual-level Capital Costs

Future phases of the feasibility study would include detailed cost estimates for new facilities. At this time, an extremely rough cost opinion can be made for general comparative purposes only. Each major project component can be considered somewhat independently from a cost perspective, so that the actual cost of the implemented project could vary widely depending on the scope and layout of the facilities actually constructed. Tables 9A-2, 9A-3, and 9A-4 present general cost information for each component.

TABLE 9A-2
Planning-level Project Costs for OUWUA District Modernization
Orland Unit Water Users' Association and Tehama-Colusa Canal Authority Regional Water Use Efficiency Project

	Quantity	Units	Unit Price ($)	Total Cost ($ million)	Assumptions
OUWUA Modernization	15,000	Acres	3,600	54	Piped distribution system for 75 percent of service area
North Canal Supply Pipeline	14,000	Linear feet	462	6.5	100-cfs, 66-inch pipeline, gravity feed from Highline Canal
North Dam Removal on Stony Creek	1	Lump sum	0.15	0.15	Demolition, removal, restoration
			Subtotal	60.7	
			Contingencies and Allowances (30%)	18.2	
			Total Construction Costs	78.9	
			Engineering, Environmental, Construction Management and Admin. (25%)	19.7	
			Total Project Cost	**98.6**	

TABLE 9A-3
Planning-level Project Costs for Regional Pipeline
Orland Unit Water Users' Association and Tehama-Colusa Canal Authority Regional Water Use Efficiency Project

	Quantity	Units	Unit Price ($)	Total Cost ($ million)	Assumptions
Regional Pipeline Black Butte Dam to TC Canal	84,000	Linear feet	672	57	Parallel 96-inch pipelines, approx. 8 miles each
			Subtotal	57	
			Contingencies and Allowances (30%)	17.1	
			Total Construction Costs	74.1	
			Engineering, Environmental, Construction Management and Admin. (25%)	18.5	
			Total Project Cost	**92.6**	

TABLE 9A-4
Planning-level Project Costs for Regional Conjunctive Management Facilities
Orland Unit Water Users' Association and Tehama-Colusa Canal Authority Regional Water Use Efficiency Project

	Quantity	Units	Unit Price ($)	Total Cost ($ million)	Assumptions
Regional Conjunctive Management Extraction Wells	35	Each	200,000	7	35 wells, 500 ft deep, 16-inch dia., 2,500 gpm. 50,000 ac-ft/yr dry-year pumping, mix of new and existing wells, 50 wells total
Monitoring Wells	25	Each	50,000	1.25	
Recharge Basins	1,940,000	Cubic yards	5	9.7	600 acres of new basins
			Subtotal	18	
			Contingencies and Allowances (30%)	5.4	
			Total Construction Costs	23.4	
			Engineering, Environmental, Construction Management and Admin. (25%)	5.9	
			Total Project Cost	**29.3**	

Initial Funding Requirements and Sources

Early phases of the project work would focus on refining the project scope and concepts through a feasibility study and conceptual design effort, and potential pilot projects where applicable. Some aspects of the initial study work, as well as the pilot projects, may be funded through existing programs. For example, the ongoing ISI conjunctive management investigation program (see Project 8A) is expected to include conceptual development of conjunctive management alternatives in this area, as well as pilot projects to establish better estimates of recharge potential and other key factors. OUWUA has also received $100,000 to begin evaluating the feasibility of modernizing their distribution system, and an additional $100,000 to begin conceptual evaluation of the regional supply and distribution facilities. An additional $200,000 is needed to fund this evaluation study.

4. Environmental Issues

Environmental Benefits

The potential environmental benefits of the proposed project derive primarily from seasonal increases in in-stream flows in both the Sacramento River and Stony Creek, improved fish passage conditions at RBDD, and removal of the two remaining fish passage barriers in Stony Creek below Black Butte Dam—the TCCA CHO seasonal gravel dam and OUWUA's North Diversion Dam. The potential environmental benefits would be quantified in subsequent stages of the project.

The Sacramento River in-stream flow increases would occur from reduced diversions at RBDD in the spring (March through mid-May) and would be expected to have resultant fishery and water quality benefits. The Stony Creek flows, if deemed necessary from the outcome of ongoing management planning, could potentially be supported by the increased surface water yield (because of conservation measures in the OUWUA service area) and seasonal use of groundwater to offset surface water diversions. The current Stony Creek minimum in-stream flows vary between 30 cfs (TCCA CHO not in use) and 40 cfs (CHO in use) between April and November, with a total required quantity of approximately 16,300 ac-ft, or about 50 percent of the estimated conservation quantity from the OUWUA distribution system modernization improvements.

Environmental/Permitting Requirements

The environmental and permitting requirements for the project would depend on the final project configuration. The following is a summary of the anticipated environmental and permitting requirements for a project of this type:

- **State Water Resources Control Board—** Applications for new water rights and changes in points of diversion would be required.
- **CVPIA—** Specific requirements regarding operations of USBR facilities and operation objectives in support of fisheries.
- **Federal and State Endangered Species Act—** Consultation with state and federal resource agencies (USFWS, NMFS, CDFG) may be required to ensure impacts to listed species are addressed.
- **U.S. Army Corp of Engineers—** Section 404 requirements may apply to removal of North Diversion Dam or other project components.
- **National Environmental Policy Act/California Environmental Quality Act (NEPA/CEQA)—** Project would need to comply with requirements of state and federal requirements.

A draft CEQA environmental checklist has been prepared for this proposed project and is included as an attachment to this evaluation. The checklist provides a preliminary assessment of the environmental areas of concern, as well as areas that are not likely to be of concern, associated with this project. The checklist would be finalized as part of the environmental compliance required for project implementation.

5. Implementation Challenges

The project implementation would occur in several incremental stages, each of which would pose significant challenges. Many of these challenges would be inherent to any project of this size and complexity. Significant environmental issues are related to long-term management of the Stony Creek watershed, with the fishery issues being paramount. The project would need to be developed in a manner that supports the objectives of the Stony Creek management plan. The project would require strong coordination among local, state, and federal agencies such as USFWS, USBR, and DWR. There would also need to be coordination with specific programs such as CALFED's ISI work related to both off-stream storage

(Sites Reservoir and Thomes-Newville Reservoir) and conjunctive management of the groundwater basin. Finally, water rights issues would need to be addressed to allow development of capacity to capture, store, and manage excess winter season and wet-year flows in both Stony Creek and the Sacramento River.

Key Stakeholders

The conceptual scale of the project necessarily involves a wide range of stakeholders whose interests may be impacted by the project. Table 9A-5 summarizes the key stakeholders and the range of issues that each would be expected to have interests and concerns regarding.

TABLE 9A-5
Stakeholder Roles and Issues
Orland Unit Water Users' Association and Tehama-Colusa Canal Authority Regional Water Use Efficiency Project

Stakeholder	Role/Concerns/Issues
OUWUA	• Project proponent and direct beneficiary • Need to upgrade system, improve operations
Local TCCA member districts	• Project proponent and direct beneficiary • Need to improve water supply reliability
GCID	• Significant local interest in project impacts on surface- and groundwater supply and management • Likely to be participant in any regional project that develops from this proposal or others
Glenn County	• Groundwater management objectives, compliance with county's Groundwater Management Ordinance (No. 1115)
Tehama County water interests	• Neighboring county to north; concerns with impacts to groundwater
Local landowners	• Groundwater level changes • Project facility construction and long-term impacts
USBR, DWR	• Orland Unit and TCCA facility operations, water rights • Integration with other regional management concepts such as off-stream storage
Environmental interest groups	• In-stream flow impacts, fishery impacts, land use

6. Implementation Plan

The following major steps would be required to implement the project. Each step depends on successful completion of the previous supporting steps, and findings that support further actions. Figure 9A-3 shows an assumed implementation schedule based on typical time requirements for each step in a project of this scale.

1.1 Feasibility studies and conceptual design—This step can begin immediately, and is intended to develop the specific project components, general features, operating concepts, and potential benefits. This step would determine the basic engineering and economic feasibility of the project, and would also help determine the need for other studies such as groundwater modeling.

2.1 Other studies (groundwater modeling)—These supporting studies would provide more detailed evaluation of specific aspects of the project, such as groundwater impacts and changes in "on-farm efficiency" from improvements to the OUWUA system.

2.2 Pilot projects—The studies may support the implementation of pilot projects such as local groundwater pumping, piping specific local portions of the OUWUA system, or diverting winter flows for recharge to existing basins. The pilot projects would provide critical information to support final design and confirm the viability of specific project operating objectives.

3.1 Preliminary design—The preliminary design would involve engineering design of the major facilities to a fairly detailed level including sizes, locations, footprints, and other. This information would support key implementation steps such as right-of-way acquisition, soils testing, mapping, and permitting and environmental studies.

4.1 Environmental assessment/environmental impact report (EA/EIR)—The EA/EIR would derive from the preliminary design and would confirm the potential impacts and required mitigation, if any, for the project.

5.1 Final design—Final design would proceed following the EA/EIR work, focusing on the preferred alternative. This would involve producing engineering drawings, specifications, and other final contract documents suitable to bid and construct the project facilities.

6.1 Permitting—The various permits would be obtained using the final design as the basis for permitting requirements.

7.1 Construction—Construction would potentially be phased over several years, given the size and complexity of the project.

Operation and Monitoring—Long-term operations and monitoring of the project would begin following completion of construction.

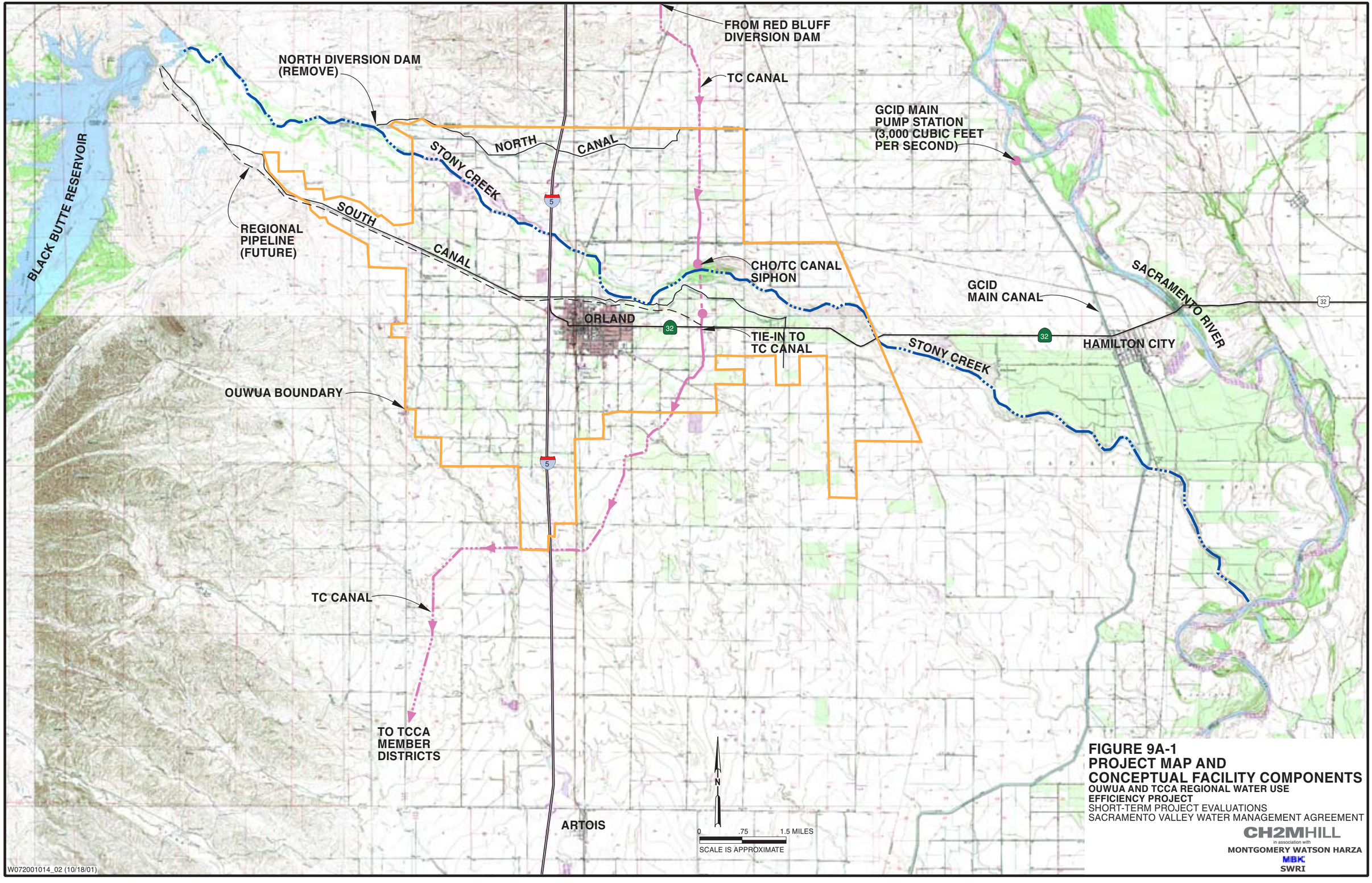

FIGURE 9A-1
PROJECT MAP AND CONCEPTUAL FACILITY COMPONENTS
OUWUA AND TCCA REGIONAL WATER USE EFFICIENCY PROJECT
SHORT-TERM PROJECT EVALUATIONS
SACRAMENTO VALLEY WATER MANAGEMENT AGREEMENT

CH2MHILL
in association with
MONTGOMERY WATSON HARZA
MBK
SWRI

W072001014_02 (10/18/01)

PROJECT AREA

FIGURE 9A-2
PROJECT LOCATION MAP
OUWUA AND TCCA
REGIONAL WATER USE EFFICIENCY PROJECT
SHORT-TERM PROJECT EVALUATIONS
SACRAMENTO VALLEY WATER MANAGEMENT AGREEMENT

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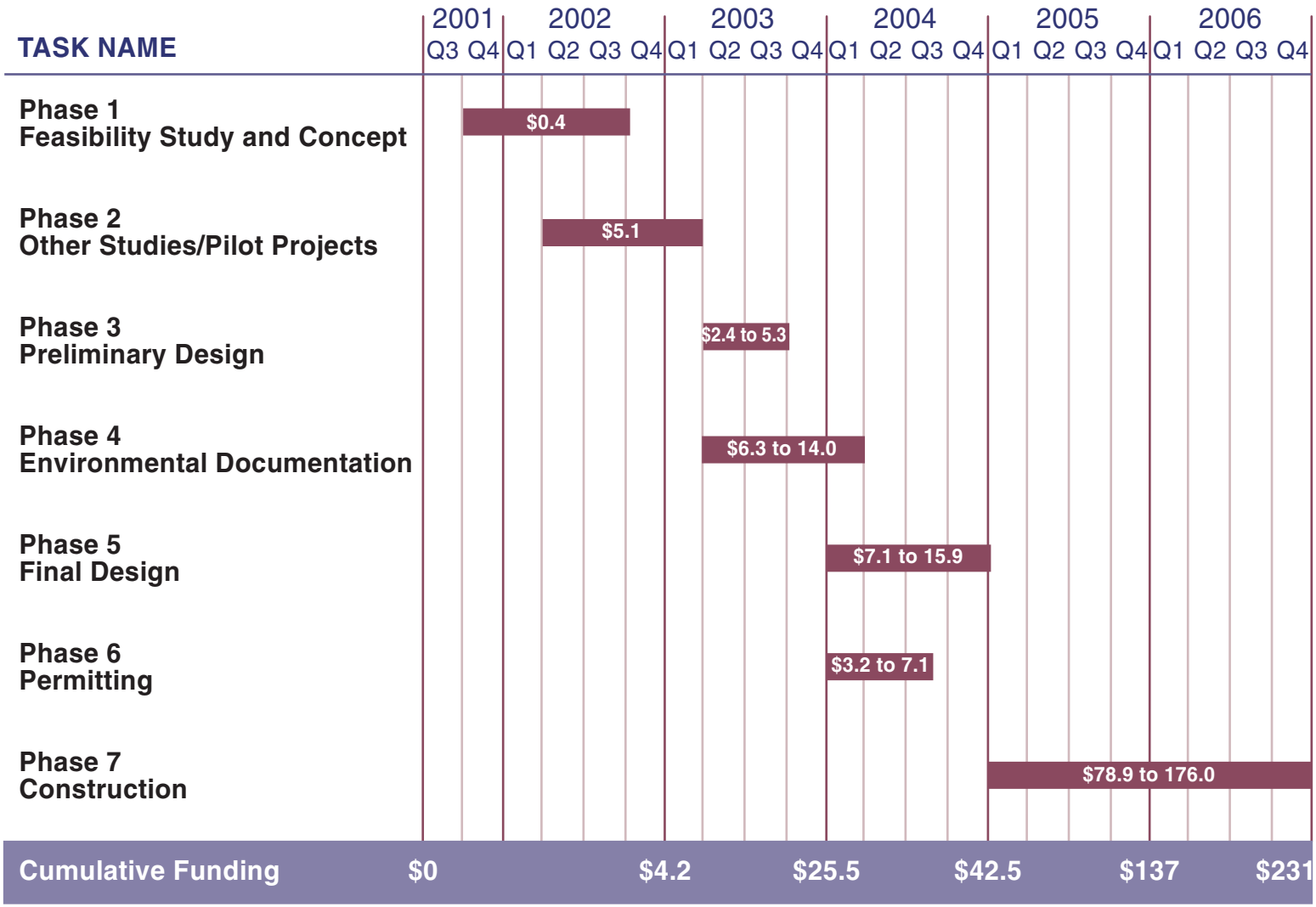
W072001014RDD_04 (10/25/01)



NOTE: ALL DOLLAR FIGURES ARE IN MILLIONS

FIGURE 9A-3
PRELIMINARY IMPLEMENTATION SCHEDULE
OUWUA AND TCCA REGIONAL WATER USE EFFICIENCY PROJECT
SHORT-TERM PROJECT EVALUATIONS
SACRAMENTO VALLEY WATER MANAGEMENT AGREEMENT

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W072001014RDD_05 (10/18/01)

Project 9A—Draft CEQA Environmental Checklist

Project 9A—Environmental Factors Potentially Affected:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Agriculture Resources	☐ Air Quality
☐ Biological Resources	☐ Cultural Resources	☐ Geology/Soils
☐ Hazards & Hazardous Materials	☐ Hydrology/Water Quality	☐ Land Use/Planning
☐ Mineral Resources	☐ Noise	☐ Population/Housing
☐ Public Services	☐ Recreation	☐ Transportation/Traffic
☐ Utilities/Service Systems	☐ Mandatory Findings of Significance	

Determination:

(To be completed by the Lead Agency)

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

_____ _____

Signature Date

_____ _____

Printed Name For

Issues:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
I. AESTHETICS—Would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☒	☐	☐
Short-term impacts from increased noise and dust emissions could occur as a result of construction. Mitigation measures implemented for noise and air quality would reduce any impacts to a less than significant level.				
d) Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒
II. AGRICULTURE RESOURCES—Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☒	☐	☐	☐
Recharge basins may be used to accelerate the recharge of water into the groundwater basin, using available excess surface water supplies in wet or average water years. Approximately 200 acres of reclaimed existing gravel mining basins adjacent to Stony Creek, and 600 acres of new recharge basins would be constructed for use as recharge basins. The recharge basins may require a permanent conversion of potential Prime Farmland, Unique Farmland, or Farmland of Statewide Importance.				
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☒	☐	☐	☐
See response to II (a) above.				
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	☒	☐	☐	☐
See response to II (a) above.				
III. AIR QUALITY—Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐

Issues:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☒	☐	☐
Increased air emissions could result from construction of the project. Implementation of best management practices (BMPs) during construction would reduce the amount of emissions and reduce the impact to a less than significant level.				
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).	☐	☐	☒	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒
IV. BIOLOGICAL RESOURCES—Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☒	☐	☐	☐
Known Endangered Species Act (ESA)-listed species such as the valley elderberry longhorn beetle and the giant garter snake are within the area. Additionally, sensitive riparian habitat exists in and around the project site. Project scheduling would have to reflect environmental regulatory requirements including any limitation on windows of construction.				
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☒	☐	☐	☐
See response to IV (a) above.				
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act, (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☒	☐	☐	☐
See response to IV (a) above.				
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or, impede the use of native wildlife nursery sites?	☒	☐	☐	☐
See response to IV (a) above.				

Issues:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☒	☐	☐
The removal of some vegetation may be required for construction of the project. Mitigation measures would be implemented to replace any vegetation removed during construction, which would reduce the impact to a less than significant level.				
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?.	☐	☒	☐	☐
See response to IV (e) above.				
V. CULTURAL RESOURCES—Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☒	☐	☐
A significant impact would occur if a cultural resource were to be disturbed by activities associated with project development. In the event that an archaeological resource was discovered, appropriate measures would be undertaken to minimize any impacts.				
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐
See response to V (a) above.				
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐
See response to V (a) above.				
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐
See response to V (a) above.				
VI. GEOLOGY AND SOILS—Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☐	☒
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?.	☐	☐	☒	☐

Issues:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☐	☒
d) Be located on expansive soil, as defined in Table18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒
VII. HAZARDS AND HAZARDOUS MATERIALS— Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
Construction equipment would require the use of potentially hazardous materials. The potential for significant hazardous material spill would be unlikely because of the limited amount of such materials that would be used onsite. If a spill or release of such materials were to occur, it could potentially be significant unless BMPs were implemented.				
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
See response to VII (a) above.				
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	☐	☐	☒	☐
h) Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒

Issues:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
VIII. HYDROLOGY AND WATER QUALITY— Would the project:				
a) Violate any water quality standards or waste discharge requirements?	☒	☐	☐	☐
Increases in turbidity would be likely to occur during any in-stream construction work. Additionally, there is a potential for an increase of erosion and sedimentation from construction activity. This could be a significant impact and would require an erosion control plan, and the implementation of BMPs to reduce any impacts to water-ways in and around the project area.				
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).	☒	☐	☐	☐
There are serious concerns about the long-term draw-down of the groundwater table and land subsidence, particularly in dry years. Model development would help in determining the effects of increased groundwater pumping. The impact that groundwater withdrawal would have on existing groundwater supplies is as yet undeter-mined; however, it is potentially significant because of the complexity of the issue.				
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☒	☐	☐
Locations of recharge basins and/or additional conveyance facilities may have some affect on drainage patterns of naturally existing waterways. These facilities would be located in such a way as to minimize any impact to existing drainage of the project area.				
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☒	☐	☐
See response to VIII (c) above.				
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐
f) Otherwise substantially degrade water quality?	☐	☒	☐	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒

Issues:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒
IX. LAND USE AND PLANNING—Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect? *Short-term impacts from increased noise and dust emissions could occur as a result of construction. Mitigation measures implemented for noise and air quality would reduce any impacts to a less than significant level*.	☐	☒	☐	☐
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒
X. MINERAL RESOURCES—Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒
XI. NOISE—Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. *Short-term noise levels are expected to increase for the duration of construction. These noise increases would be temporary, and mitigation measures would be implemented to reduce any impact to a less than significant level.*	☐	☒	☐	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.	☐	☐	☐	☒
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.	☐	☒	☐	☐

Issues:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
XII. POPULATION AND HOUSING—Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure).	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
XIII. PUBLIC SERVICES—Would the project:				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services?	☐	☐	☐	☒
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☒	☐
XIV. RECREATION—Would the project:				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?	☐	☐	☐	☒

Issues:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
XV. TRANSPORTATION/TRAFFIC—Would the project:				
a) Cause an increase in traffic, which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	☐	☐	☒	☐
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☐	☐	☒	☐
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☐	☒
f) Result in inadequate parking capacity?	☐	☐	☐	☒
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☐	☐	☐	☒
XVI. UTILITIES AND SERVICE SYSTEMS—Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☒	☐

Issues:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
XVII. MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☒	☐	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☒	☐	☐
c) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐